

Name: _____

Date: _____

11.3: Vertical and Horizontal Reflections NOTES

Algebra I

Exploratory Challenge 1: Reflecting Functions

$$f(x) = 2^x$$

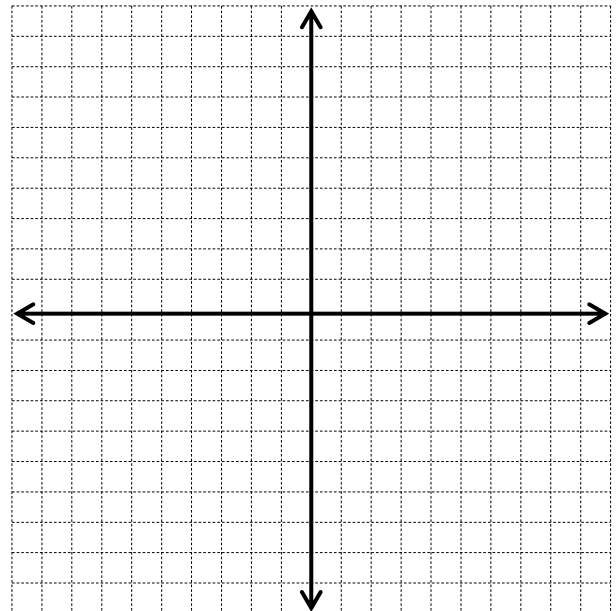
If $f(x) = 2^x$, then $-f(x) =$ _____. Let's call this new function $g(x)$.

If $f(x) = 2^x$, then $f(-x) =$ _____. Let's call this new function $h(x)$.

Therefore... $f(x) =$ _____ $g(x) =$ _____ $h(x) =$ _____

Complete the table of values for these three functions and graph them.

x	$f(x)$	$g(x)$	$h(x)$
-3	0.125		
-2	0.25		
-1	0.5		
0	1		
1	2		
2	4		
3	8		



How do the functions $g(x)$ and $h(x)$ compare to $f(x)$ graphically and numerically?

Exploratory Challenge 2: Reflecting Functions

$$f(x) = \sqrt{x}$$

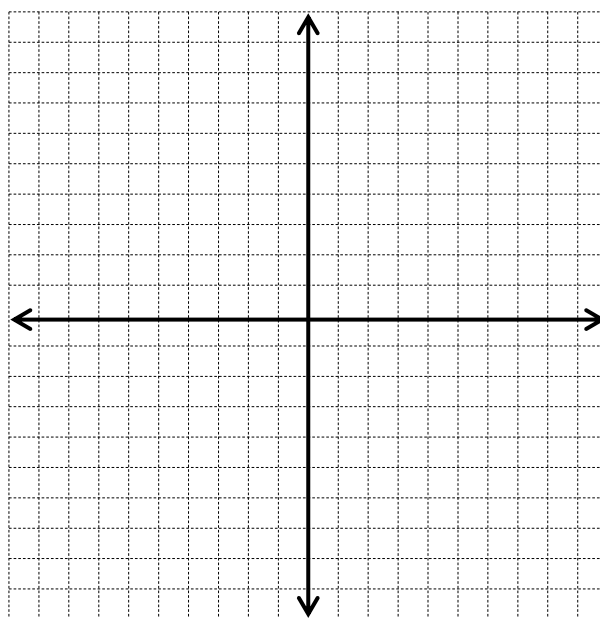
If $f(x) = \sqrt{x}$, then $-f(x) = \underline{\hspace{2cm}}$. Let's call this new function $g(x)$.

If $f(x) = \sqrt{x}$, then $f(-x) = \underline{\hspace{2cm}}$. Let's call this new function $h(x)$.

Therefore... $f(x) = \underline{\hspace{2cm}}$ $g(x) = \underline{\hspace{2cm}}$ $h(x) = \underline{\hspace{2cm}}$

Complete the table of values for these three functions and graph them.

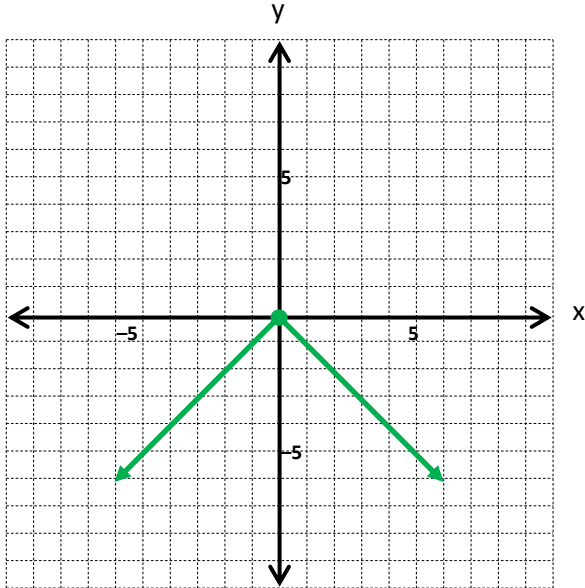
x	$f(x)$	$g(x)$	$h(x)$
-9			
-4			
-1			
0			
1			
4			
9			



How do the functions $g(x)$ and $h(x)$ compare to $f(x)$ graphically and numerically?

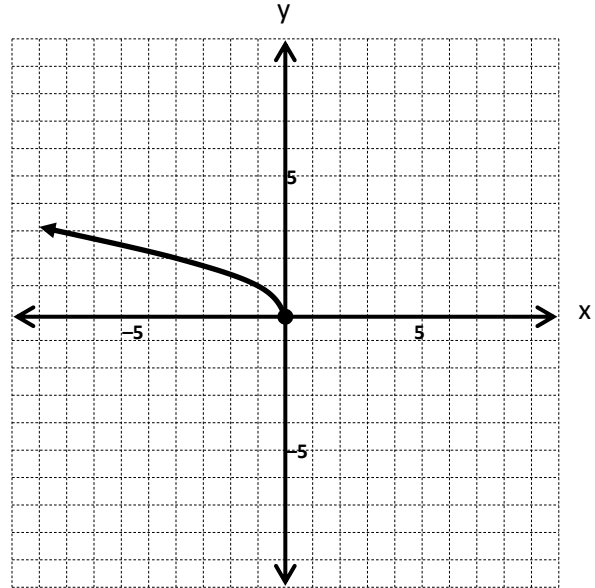
3. Write the equation for the graph.

$h(x) =$



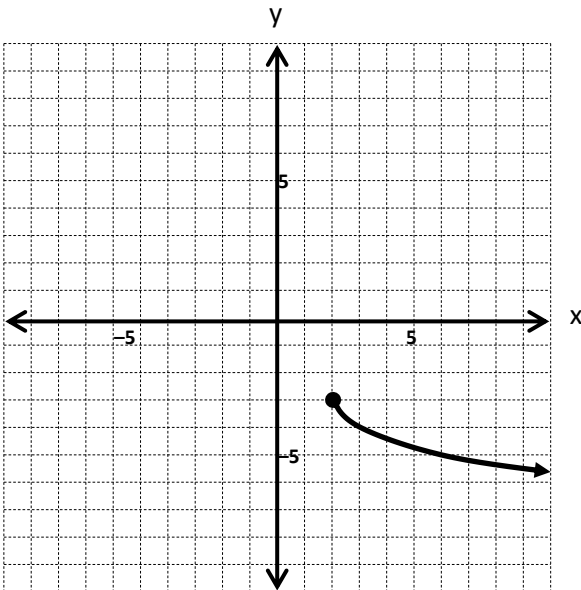
4. Write the equation for the graph.

$g(x) =$



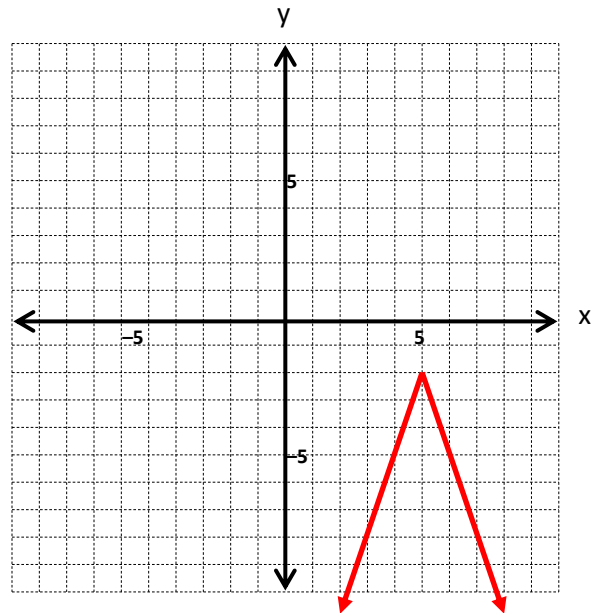
5. Write the formula for the graph below.

$h(x) =$



6. Write the formula for the graph below.

$p(x) =$



Write a formula for the function whose transformation is described below.

7. The graph of the function $f(x) = x^2$ is reflected over the x -axis, horizontally stretched by a factor of 3, and **then** undergoes a translation of 5 units down.
8. The graph of the function $f(x) = 3^x$ is vertically compressed by a factor of $\frac{1}{4}$ and **then** is reflected over the y axis.
9. The graph of the function $f(x) = |x|$ is vertically stretched by a factor of 4, is reflected over the x -axis, and **then** undergoes a translation of 3 units to the left.

Name: _____

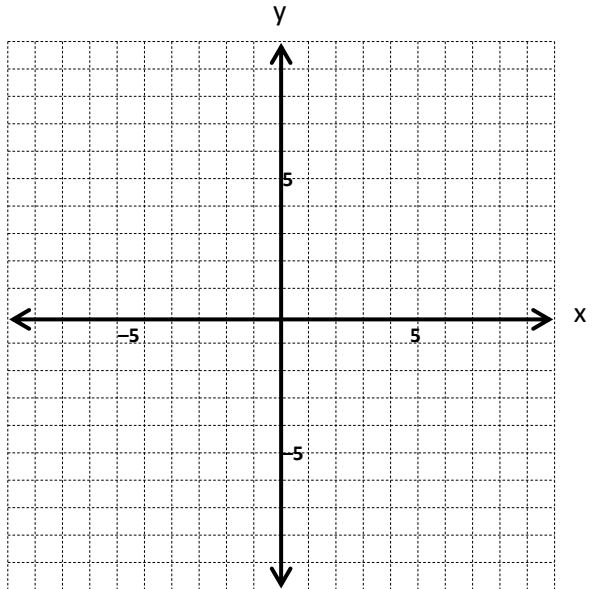
Date: _____

11.3: Vertical and Horizontal Reflections HW

Algebra I

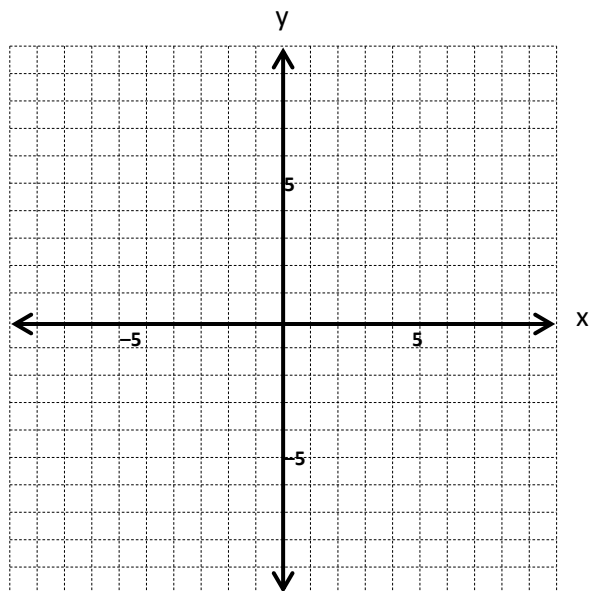
1. Graph $f(x) = \sqrt{x}$

Reflect $f(x)$ over the y-axis and **then** translate it down 2. What is the equation of this new graph?



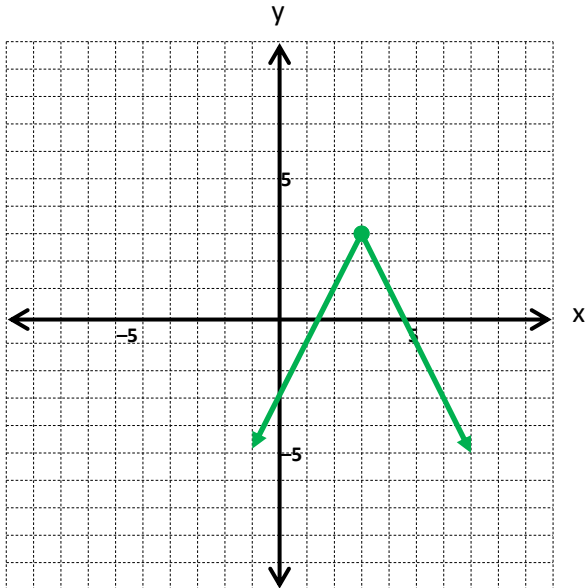
2. Graph $f(x) = |x|$

Reflect $f(x)$ over the x-axis and **then** translate it to the left 2 and up 3. What is the equation of this new graph?



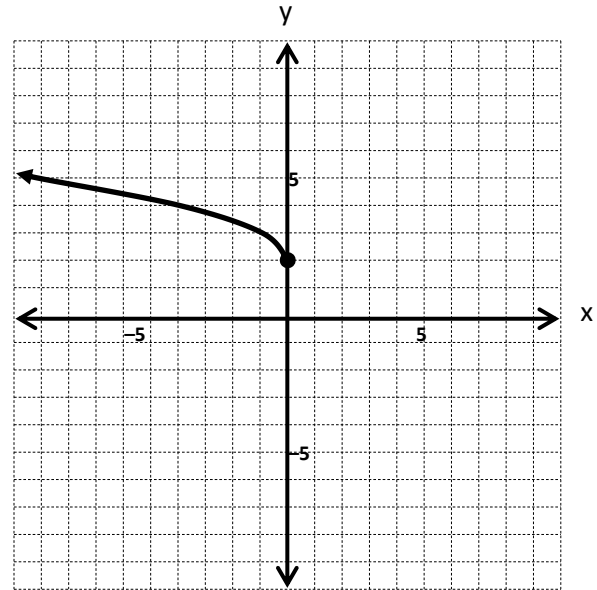
3. Write the equation for the graph.

$h(x) =$



4. Write the equation for the graph.

$g(x) =$



Write a formula for the function whose transformation is described below.

5. The graph of the function $f(x) = x^2$ is horizontally stretched by a factor of 2, is reflected over the x-axis and **then** undergoes a translation of 3 units up.

6. The graph of the function $f(x) = 2^x$ is vertically compressed by a factor of $\frac{1}{5}$ and **then** is reflected over the y-axis.